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(19)

(54) METHOD AND APPARATUS FOR APPLYING FLOCKING TO A BASE

(71) We, SCHMIDT INDUSTRIES INC., a Corporation of the State of North Carolina, United States of America, of 800 Foster Avenue, Charlotte, North Carolina, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a method of applying multi-color flock to a base structure in a predetermined pattern.

The invention provides a method of applying flock which includes flock of different colors to a base surface in a predetermined pattern, said method including the steps of applying an adhesive to said base surface through a master stencil element perforated with said predetermined pattern, forming a series of individual flocking stencils from a fine mesh gauze-like screening material in which only selected portions of said stencils are pervious having said gauze-like material disposed within said pervious selected portions, each of said individual flocking stencils being formed with said pervious portion thereof representing a different and distinct portion of said predetermined pattern, sequentially advancing said base to which said adhesive has been applied through a series of flocking stations, each flocking station including a supply of flock and including a different one of said flocking stencils interposed between and spaced from said supply and said base surface with the positional relationship between each said flocking stencil and said base surface being identical for each flocking operation, the flocking supply for each operation being of a different color, and imposing an electrical potential between the flock supply and the base surface for each flocking operation to cause said flock to pass through said gauze-like material disposed within the perylous portions of said flocking stencil in perpendicular relation thereto and adhere evenly to a portion of said base surface corresponding to the area defined by said pervious portions in said flocking stencil.

Preferably said flock supply for each station is contained in a box-like container having a metal bottom plate to which a positive electrical source is electrically connected, said base surface for each station being carried by a metal plate disposed across the top of said container, said metal plate being electrically connected to ground.

Said flocking stencil may be formed from a polyester gauze having a fine mesh.

The invention also provides an apparatus for applying flock which includes flock of different colors to a base surface in a predetermined pattern, said apparatus including a master stencil element perforated with said predetermined pattern through which an adhesive can be applied to said base surface, and a plurality of flocking stations, each flocking station including a supply of flock, a flocking stencil of fine gauze-like screening material perforated with a different portion of said predetermined pattern and means for supporting said base surface above said supply of flocking with said flocking stencil interposed between said flocking supply and said base surface, said supporting means including means for fixing the location of said base surface and said flocking stencil to have a positional relationship which is precisely identical at each said flocking operation, and means for imposing an electrical potential between the flocking supply and the base surface at each flocking operation to cause said flock to pass through the perforations in said flocking stencil in perpendicular relation thereto and adhere to a portion of said base surface corresponding to the perforations in said flocking stencil.

Said supporting means for each flocking operation may include a supporting surface for supporting said base surface, in that said

means for fixing the location of said base surface and said flocking stencil includes fixed guide means on said supporting surface for positioning said base surface thereon, and further includes fixed means for selectively attaching said flocking stencil to said supporting surface at a fixed position thereon superimposed over said positioned base surface in spaced relation thereto, and in that said supporting surface is a metal plate connected to ground and said flocking supply is contained in a box having metal bottom plate connected to a positive electrical source.

The following is a description of a specific embodiment of the invention, reference being made to the accompanying drawings in which:

Figure 1 is a plan view illustrating a master stencil of a selected flocking design, and a plurality of flocking stencils, each flocking stencil being used for a different colored flock;

Figure 2 is a perspective view of suitable equipment for practising the flocking method of the present invention;

Figure 3 is a detail view illustrating one of the flocking stations of the equipment illustrated in Figure 2; and

Figure 4 is a side elevational view of the flocking station illustrated in Figure 3.

Looking now in greater detail at the accompanying drawings, Figure 2 illustrates equipment for applying flock to a substrate or base in accordance with the present invention. This equipment includes a station 10 at which an adhesive applying operation is carried out, and four separate stations 12 at which flocking operations are carried out, each of which is identical except for the color of the flock applied thereat and the stencil employed.

The adhesive station includes an upper work surface 14 to which a side guide plate 16 is secured and to which a similar top guide plate (not shown) is secured to extend in perpendicular relation to the side guide plate 16 for particularly locating a base member 18 to which flock is to be applied, the base member 18 being positioned flush against the two guide plates. A pair of hinges 20 having upstanding rods 22 are secured to the work surface 14, and a pair of locating pins 24 are permanently secured to the front side of the adhesive station 10. An adhesive applying stencil 26, the details of which will be explained in further detail presently, is mounted in a frame 28 that includes projecting brackets 30 having apertures for receiving the locating pins 24 and that includes similar brackets (not shown) for receiving the upstanding rods 22. It will be noted that the base member 18 and the adhesive stencil 26 have exact positions on the work surface 14, and the precise relationship of the stencil 26 to the base member 18 is positively maintained by resilient bands 32 which are secured to the front wall of adhesive station 10 and arranged to slide over the brackets 30 for holding the frame 28 as adhesive is applied to the stencil 26 with a brush 34 or similar implement.

Since the four flocking stations 12 are identical except for the color of the flocking applied, a description of the first flocking operation 12 will serve to provide an understanding of the remaining flocking stations. The flocking station 12 includes a work surface 36 on which lies a mounting box 38 having a holding surface 40 which is preferably a 1/8-inch aluminium plate formed with a plurality of apertures 42 opening into the interior of the mounting box 38 wherein a vacuum is established by a hose 44 leading from the interior of the mounting box to any convenient vacuum source (not shown). The holding surface 40 is provided with a top guide plate 46 and a side guide plate 48, and with locating pins 50, upstanding rods 52, and resilient bands 54, all corresponding to like elements as previously described in connection with the adhesive station 10. The mounting box 38 is also provided with a lifting handle 56 and a spacing block 58 rigidly secured thereto, and the entire mounting box 38 is connected by hinges 60 to a dividing element 62 lying between the mounting box 38 and an open box-like container 64 in which a supply of flocking 66 is held. The container 64 is formed by a galvanized metal bottom plate 68 and clear sides 70 formed of an acrylic plastics extending above and beneath the bottom plate 68. To establish the electrical potential for causing the flock 66 to be applied to the base member 18 in a manner to be described presently, the galvanized metal bottom plate 68 is connected by an electrical wire 72 to a conventional high voltage direct-current transformer 74 (i.e., 100 Kv) so that a positive potential is imposed on the bottom plate 68, and the aluminium plate forming the holding surface 40 is connected by wires 82 to any convenient ground whereby this aluminium plate is electrically negative. The transformer 74 may be used for all of the flocking stations 12 which are wired in series, and a single control switch 74' is provided for energizing the transformer 74. If desired, a separate control switch could be provided for each flocking station 12.

In Figure 1 there is illustrated a typical series of stencils used in connection with the method of the present invention, these stencils displaying a relative intricate design in the form of a gamecock which is to be flocked onto the base member 18. At the

of separation between the grounded holding surface 40 and the bottom 68 of the flock container 64, and in the disclosed embodiment of the present invention this separation is in the range of 4 to 6 inches. Thus, the transformer 74 establishes a proper electrical potential which causes the individual flock filaments 66 to "shoot" or pass through the perforations in the flocking stencil 76 in perpendicular relation thereto so that only the leading end of each such flock filament 66 will engage the adhesive pattern on the base member 18 and will adhere to the base member 18 in perpendicular or upstanding relation thereto. It will be noted that this "shooting" of the flocking filaments 66 perpendicularly through perforations in the flocking stencil 76 that are carefully defined and positioned with respect to the base element 18 will result in the flock filaments 66 forming a pattern on the base element 18 which corresponds identically to the perforated pattern of the flocking stencil 76.

As soon as the black flock 66 has been applied to the base member 18 at the first flocking station 12 in the above-described manner, the base member 18 is immediately removed and the same procedure is followed in applying yellow flock 66 to the base member 18 at the second flocking station 12 using the next flocking stencil 76'. Thereafter, red flock is applied at the third flocking station 12 using the third flocking stencil 76''. It is important to note that even though the perforated portions of the flocking stencils 76, 76' and 76'' are immediately contiguous in the completed overall design, the final flocked design which appears on the base member 18 includes sharp and distinct lines between the different colors of flock because the positional relationship between the base member 18 and the flocking stencils 76, 76' and 76'' is identical at each flocking operation and because the individual flocking filaments are "shot" perpendicularly through the stencil perforations to provide a sharply defined pattern on the base member 18.

WHAT WE CLAIM IS:—

1. A method of applying flock which includes flock of different colors to a base surface on a predetermined pattern, said method including the steps of applying an adhesive to said base surface through a master stencil element perforated with said predetermined pattern, forming a series of individual flocking stencils from a fine mesh gauze-like screening material in which only selected portions of said stencils are pervious having said gauze-like material disposed within said pervious selected portions, each of said individual flocking stencils being formed with said pervious portion thereof representing a different and distinct portion of said predetermined pattern, sequentially advancing said base to which said adhesive has been applied through a series of flocking stations, each flocking station including a supply of flock and including a different one of said flocking stencils interposed between and spaced from said supply and said base surface with the positional relationship between each said flocking stencil and said base surface being identical for each flocking operation, the flocking supply for each operation being of a different color, and imposing an electrical potential between the flock supply and the base surface for each flocking operation to cause said flock to pass through said gauze-like material disposed within the pervious portions of said flocking stencil in perpendicular relation thereto and adhere evenly to a portion of said base surface corresponding to the area defined by said pervious portions in said flocking stencil.

2. A method of applying flocking as defined in Claim 1 and further characterized in that said flock supply for each station is contained in a box-like container having a metal bottom plate to which a positive electrical source is electrically connected, said base surface for each station being carried by a metal plate disposed across the top of said container, said metal plate being electrically connected to ground.

3. A method of applying flocking as defined in Claim 1 and further characterized in that said flocking stencil is formed of a polyester filament gauze having a fine mesh.

4. Apparatus for applying flock which includes flock of different colors to a base surface in a predetermined pattern, said apparatus including a master stencil element perforated with said predetermined pattern through which an adhesive can be applied to said base surface, and a plurality of flocking stations, each flocking station including a supply of flock, a flocking stencil of fine mesh gauze-like screening material perforated with a different portion of said predetermined pattern and means for supporting said base surface above said supply of flocking with said flocking stencil interposed between said flocking supply and said base surface, said supporting means including means for fixing the location of said base surface and said flocking stencil to have a positional relationship which is precisely identical at each said flocking operation, and means for imposing an electrical potential between the flocking supply and the base surface at

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each flocking operation to cause said flock to pass through the perforations in said flocking stencil in perpendicular relation thereto and adhere to a portion of said base surface corresponding to the perforations in said flocking stencil.

5. Apparatus for applying flocking to a base surface as defined in Claim 4 and further characterized in that said supporting means for each said flocking operation includes a supporting surface for supporting said base surface, in that said means for fixing the location of said base surface and said flocking stencil includes fixed guide means on said supporting surface for positioning said base surface thereon, and further includes fixed means for selectively attaching said flocking stencil to said supporting surface at a fixed position thereon superimposed over said positioned base surface in spaced relation thereto, and in that said supporting surface is a metal plate connected to ground and said flocking supply is contained in a box having metal bottom plate connected to a positive electrical source.

6. A method of apply flocking as claimed in Claim 1 and substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

7. Apparatus for applying flocking substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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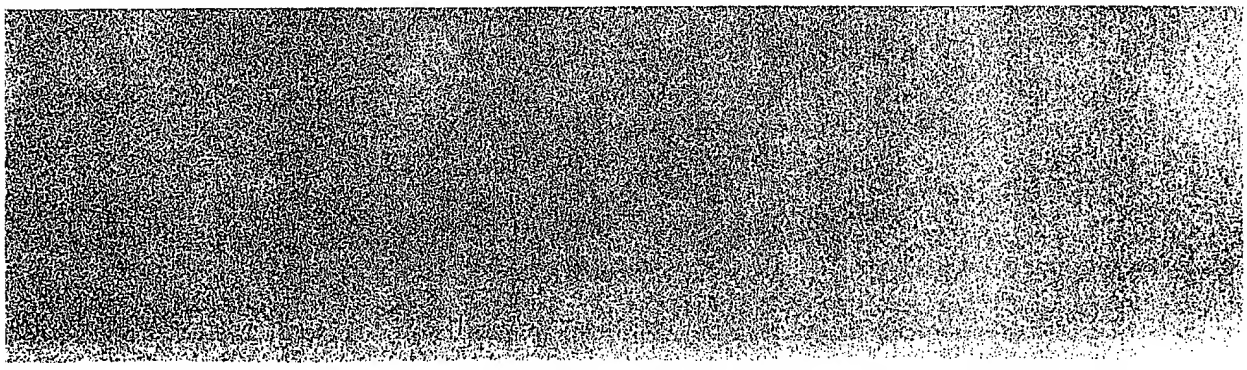

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Sheet 1

Fig. 1

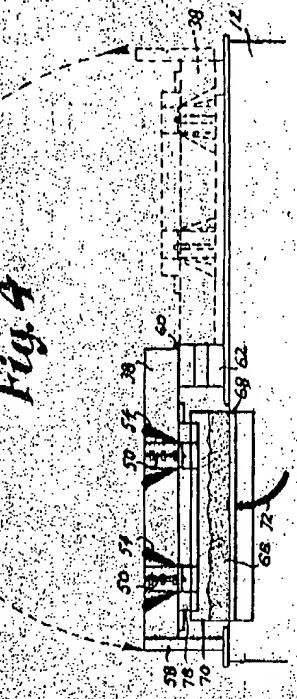

Fig. 4

1466271 COMPLETE SPECIFICATION
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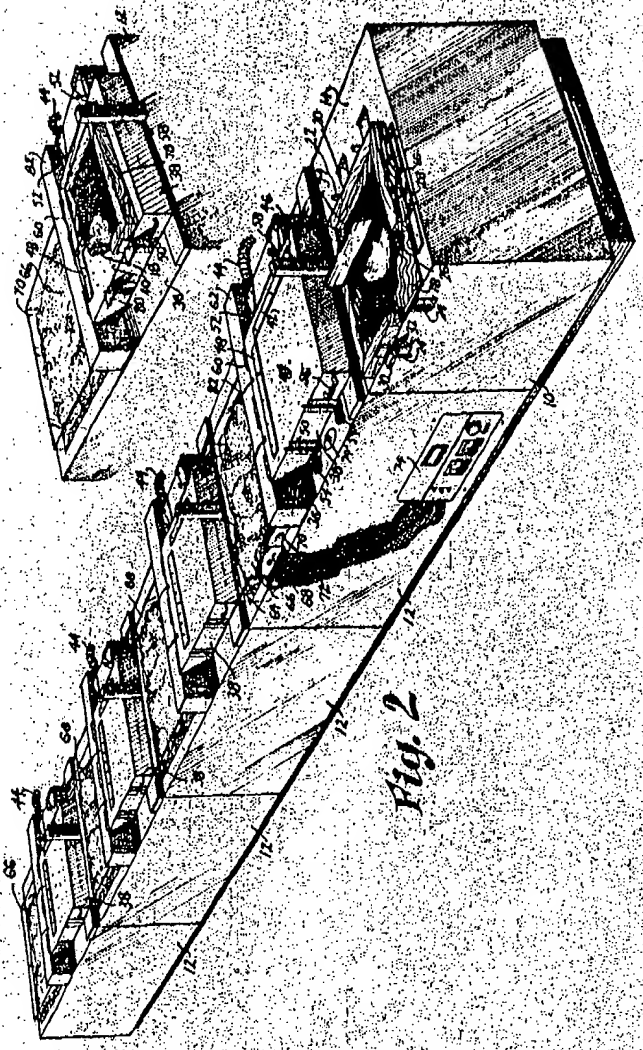

Fig. 3

Fig. 2

Patent No. 1466271

Date of Patent 31 December 1973.

Date of Sealing 29 June 1977

Elizabeth the Second by the Grace of God of the United Kingdom of Great Britain and Northern Ireland and of Her other Realms and Territories, Queen, Head of the Commonwealth, Defender of the Faith: To all to whom these presents shall come greeting:

WHEREAS a request for the grant of a patent has been made by

Schmidt Industries Inc, a Corporation organised under the laws of the State of North Carolina, United States of America, of 300 Foster Avenue, Charlotte, North Carolina, United States of America,

for the sole use and advantage of an invention for

Method and apparatus for applying flocking to a base:

AND WHEREAS We, being willing to encourage all inventions which may be for the public good, are graciously pleased to condescend to the request:

KNOW YE, THEREFORE, that We, of our especial grace, certain knowledge, and mere motion do by these presents, for Us, our heirs and successors, give and grant unto the person(s) above named and any successor(s), executor(s), administrator(s) and assign(s) (each and any of whom are hereinafter referred to as the patentee) our especial licence, full power, sole privilege, and authority, that the patentee or any agent or licensee of the patentees and no others, may subject to the conditions and provisions prescribed by any statute or order for the time being in force at all times hereafter during the term of years herein mentioned, make, use, exercise and vend the said invention within our United Kingdom of Great Britain and Northern Ireland, and the Isle of Man, and that the patentee shall have and enjoy the whole profit and advantage from time to time accruing by reason of the said invention during the term of sixteen years from the date hereunder written of these presents; AND to the end that the patentee may have and enjoy the sole use and exercise and the full benefit of the said invention, We do by these presents for Us, our heirs and successors, strictly command all our subjects whatsoever within our United Kingdom of Great Britain and Northern Ireland, and the Isle of Man, that they do not at any time during the continuance of the said term either directly or indirectly make use of or put in practice the said invention, nor in anywise imitate the same, without the written consent, licence or agreement of the patentee, on pain of incurring such penalties as may be justly inflicted on such offenders for their contempt of this our Royal Command, and of being answerable to this patentee according to law for damages thereby occasioned.

PROVIDED ALWAYS that these letters patent shall be revocable on any of the grounds from time to time by law prescribed as grounds for revoking letters patent granted by Us, and the same may be revoked and made void accordingly:

PROVIDED ALSO that nothing herein contained shall prevent the granting of licences in such manner and for such considerations as they may by law be granted: AND lastly, We do by these presents for Us, our heirs and successors, grant unto the patentee that these our letters patent shall be construed in the most beneficial sense for the advantage of the patentee.

IN WITNESS whereof We have caused these our letters to be made patent as of the thirty-first day of December one thousand nine hundred and seventy-three and to be sealed.

Comptroller-General of Patents Designs, and Trade Marks.

NOTE

You are reminded that this patent is granted for a term beginning on the date of the filing on the complete specification (that is the date of the patent given overleaf) and ending at the expiration of 16 years from that date, subject to the payment by you or by someone on your behalf, before the expiration of the 4th and each succeeding year during the term of the patent, of the prescribed fees. All or any of these annual payments may be made in advance and a Patents Form 24 should accompany the appropriate fees.

You are warned that if the form with the fee is not lodged in the Patent Office on or before the anniversary date of the patent, the fee cannot be accepted unless application for an extension of time to a maximum of 6 months is made and paid for on Patents Form 25. Thereafter if no renewal fee is received and no extension of time is requested, the patent will cease.

No reduction of extension fees is made in the case of a patent endorsed "Licences of Right". When paying a renewal or extension fee you are advised to check the current scale of charges as these may change from time to time.

If any person becomes entitled by assignment, transmission or other operation of law to this patent, or a part interest therein, or to any interest as mortgagee or licensee or otherwise, application must be made to the Comptroller to register such title of interest (see Section 74 of the Patents Act). Particulars as to the manner of making such application may be obtained from the Patent Office.

PROCEDURE FOR PAYMENT OF FEES

Patents fees are payable direct to the Patent Office by means of cash, money order, postal order, banker's draft or cheque. (Adhesive stamps will not be accepted in payment of fees.) The prescribed fee must be submitted together with the appropriate completed Patents Form; in addition each form or batch of forms should be accompanied by a fee sheet (FS. 1) showing details of the form(s) and the amount(s) of the fee(s). Cheques, money orders, etc., should be made payable to "The Comptroller-General, Patent Office", and crossed. Patents Forms, together with the fees and fee sheet (FS. 1) may be delivered to the Patent Office in London either by hand or by post; those sent by post should be addressed to "The Cashier, The Patent Office, 25 Southampton Buildings, London WC2A 1AY".

Blank Patents Forms and fee sheets (FS. 1) can be obtained from the Clerk of Stationery, The Patent Office, 25 Southampton Buildings, London WC2A 1AY.

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"WORKING" OF PATENTS

Laws require patented invention to be "worked"

One of the objects of the grant of patents is to encourage industry and trade in the country in which the patent is granted. Consequently the laws of most countries require a patentee to "work" the patented invention.

A limited period (three years from grant of the patent in many cases) is allowed for "working" to be started.

Nature of "working"

In countries where manufacturing industry is established, or is being encouraged, the law usually requires actual manufacture of the patented invention to be carried on there. In some less industrialised countries, importation of articles embodying the invention may be sufficient to meet the requirements as to "working".

Penalties for non-working

The laws of the various countries usually provide that if the patentee does not "work" the patented invention in the country, any person who wishes to manufacture, or possibly import, articles embodying the invention may apply for and obtain a "compulsory licence" under a patent. That is to say, a licence enforced by the Government of the country, possibly against the wishes of the patentee but usually giving the patentee some measure of recompense. The laws of many countries provide for the possibility of a patent being revoked if it is not worked by the patentee and if the grant of compulsory licences is not adequate to achieve exploitation of the invention in the particular country.

In some countries, e.g. Argentina, Greece, there is no provision for the grant of "compulsory licences" for non-working, - only for revocation of the patent for non-working at the suit of a third party.

"Nominal working"

In cases where the patentee does not wish to, or is unable to, work the invention in a particular country so-called "nominal working" or "formal working" is sometimes carried out, and we can have this done when our clients so wish. "Nominal working" takes the form of advertisements in appropriate journals and letters to various commercial organisations, offering to grant licences under the patent and, usually, also offering the patent for sale.

Purpose of "nominal working"

The intended purpose of "nominal working" is to provide evidence that an attempt has been made by the patentee to have the invention commercially exploited in the particular country concerned and to counteract any suggestion that the patentee has employed his patent to prevent the inhabitants of the particular country from enjoying the benefits of the invention. Such evidence may be of value in the event of an application being made for a compulsory licence under the patent or for revocation of the patent on the ground that the patented invention has not been worked.

A disadvantage of "nominal working" in some cases

If however "nominal working" is carried out without any real desire or intention on the part of the patentee to grant licences, or to sell the patent, on reasonable terms, then the patentee's attitude is unlikely to be regarded as a reasonable one in the event of application being made to him for a licence or for purchase of the patent. Consequently, in those circumstances the result of the "nominal working" may well be to strengthen, rather than to weaken, the case for the grant of a compulsory licence.

Opinions as to the desirability of "nominal working"

The number of applications which are made for compulsory licences, or for revocation, for non-working is very small and there is no substantial body of decided cases to provide any definite guidance as to the practical consequences of non-working of patents and the relative advantages and disadvantages of "nominal working". Consequently there is much room for individual opinions.

In our view, it is only very rarely that "nominal working" is likely to be of any value in countries where there is provision for compulsory licences, and in such countries the disadvantage of "nominal working" mentioned above may be a very good reason for not carrying out "nominal working". When a patentee is willing to grant licences on reasonable terms this will become known to anyone who seeks a licence from him, and there is no need for a compulsory licence to be sought.

(continued overleaf)

Spain

In Spain it is essential that a formal declaration of willingness to grant licences be registered at the Spanish Patent Office before the end of each of the third and subsequent years of the patent, if the patented invention is not being actually manufactured in Spain. "Endorsement" (i.e. registration of actual working or registration of the above-mentioned declaration of willingness to grant licences) is usually attended to at the time when renewal fees are paid in that country.

(In the case of a Spanish Patent of Importation, actual manufacture in Spain must be carried out within three years after grant; it is not sufficient to declare willingness to grant licences).

Mexico

In Mexico a patent may be cancelled after the end of the 12th year unless either actual industrial exploitation in Mexico, or the "impossibility or material difficulty" of such exploitation, is proved.

(In the case of a Mexican Design patent it may be cancelled after the 7th year unless the above-mentioned conditions are proved).

Countries in which "nominal working" is recommended or usual

In the following countries "nominal working" is recommended or regarded as usual practice:

Argentina, Bolivia, Brazil, Bulgaria, Greece, Iraq, Lebanon, Peru, Roumania, Syria, Turkey, Venezuela.

Pakistan

In Pakistan there is a strong body of opinion in favour of "nominal working".

Some other countries

For the following countries we believe that "nominal working" is of little or no value for its intended purpose and may serve merely to draw attention to a failure to work the invention in the way required by the laws:

United Kingdom of Great Britain & Northern Ireland, Australia, Austria, Belgium, Canada, Denmark, Eire, Finland, France, German Federal Republic, Holland, India, Israel, Italy, Japan, New Zealand, Norway, Sweden, Switzerland, Republic of South Africa.

U.S.A.

Working of a patented invention is not required by law in the United States of America.

We can obtain advice in individual cases

The above remarks are based partly on experience in this office and partly on information supplied by professional bodies and firms in many countries. The relevant laws differ considerably in detail from country to country and consequently the above generalisations cannot deal fully with all circumstances. We recommend that we should be instructed to seek the advice of our Associates in the appropriate country in individual cases.

BOULT, WADE & TENNANT

April, 1969

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